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(54) Title: COMPOSITIONS COMPRISING ARTIFICIAL SWEETENERS AND A YEAST EXTRACT, USE THEREOF AND FOOD COMPRISING THE SAME

(57) Abstract: The present invention describes compositions comprising an artificial sweetener and a yeast extract, said yeast extract comprising free amino acids and one or more 5'-ribonucleotide(s), wherein the total amount of said one or more 5'-ribonucleotide(s) is at least 10% w/w, wherein said one or more 5'-ribonucleotide(s) comprises 5'-GMP and optionally 5'-IMP and wherein the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is lower than 3.5, all weights in the yeast extract being based on NaCl free yeast extract dry matter. Preferably said yeast extract comprises an amount in free amino acids lower than 40% based on NaCl free yeast extract dry matter and/or has a degree of protein hydrolysis lower than 50%. Preferably, the weight ratio between artificial sweetener and yeast extract in the compositions based on NaCl free yeast extract dry matter is lower than 15, preferably comprised between 0.001 and 6. When these compositions are used to sweeten foodstuff, they do not confer any aftertaste or any taste intrinsic to the yeast extract to the food. Foodstuff comprising said compositions, the use of said compositions and of the yeast extract to sweeten foodstuff are also described.

COMPOSITIONS COMPRISING ARTIFICIAL SWEETENERS AND A YEAST EXTRACT, USE THEREOF AND FOOD COMPRISING THE SAME

The present invention relates to compositions comprising an artificial sweetener and a yeast extract, to the use thereof in a food product or as food product as such, and to food products comprising said compositions. Further the present invention relates to the use of yeast extracts for masking the after taste of an artificial sweetener in a food product.

Artificial sweeteners are herewith intended as food additives able to impart a sweet taste to sugar-free foodstuff. Sugar-free means: which does not contain sweet. natural mono- or disaccharides, like glucose, sucrose, fructose, galactose, maltose, lactose, etcetera. Artificial sweeteners are low-calorie or no-calorie products and are in general several times sweeter than sucrose. They are often produced by synthesis and are often not present in nature. A typical disadvantage related to the use of artificial sweeteners is the development of side taste, for example bitterness or after taste, for example like in the case of thaumatin or stevioside, the development of a liquorice-like aftertaste in the flavoured foodstuff. This problem is especially present during long-term storage of foodstuff, in particular of soft drinks and/or during warming up of food comprising said sweeteners. The most common artificial sweeteners, which present the above-mentioned problems, are: acesulfame-K, alitame, aspartame, cyclamate, neotame, neohesperidine, saccharin, stevioside, sucralose, and thaumatin. Also combinations of two or more artificial sweeteners are frequently used.

GB Patent Specification No. 1,110,746 describes a method for reducing the aftertaste of artificial sweetener-containing compositions by incorporating therein a ribonucleoside or ribonucleotide or a deoxy-analogue thereof. This method has the disadvantage that the ribonucleosides, ribonucleotides or their deoxy-analogues need to be chemically isolated from RNA/DNA sources.

Yeast can be used as natural source of RNA. Yeast extracts can be obtained a.o. from the genera *Saccharomyces*, *Kluyveromyces* and *Candida*.

Autolytic yeast extracts are concentrates of the soluble materials obtained from yeast after disruption of the cells and digestion (lysis) of the polymeric yeast material. The active yeast enzymes released in the medium after cell disruption are responsible for the lysis. This type of yeast extracts, which are rich in amino acids, are used in the

food industry as basic taste providers. The amino acids present in the yeast extract add a bouillon-type brothy taste to the food.

Hydrolytic yeast extracts, on the other hand, are concentrates of the soluble materials obtained from yeast after disruption of the cells and digestion (lysis), when to the yeast suspension during lysis additional proteases, and/or peptidases and especially nucleases are added. During this process 5'-ribonucleotides of guanine (5'-GMP), uracil (5'-UMP), cytosine (5'-CMP) and adenine (5'-AMP) are formed. When adenylic deaminase is added to the mixture, 5'-AMP is transformed into 5'-inosine mono phosphate (5'-IMP). The hydrolytic yeast extracts obtained by this method are therefore rich in 5'-ribonucleotides, especially rich in 5'-GMP and 5'-IMP. Often yeast extracts are also rich in mono sodium glutamate (MSG). 5'-IMP, 5'-GMP and MSG are known for their flavour enhancing properties. They are capable of enhancing the savoury and delicious taste in certain types of food. This phenomenon is described as 'mouthfeel' or umami. These yeast extracts rich in 5'-ribonucleotides and, optionally, rich in MSG, are usually applied in soups, sauces, marinades, and flavour seasonings.

European Patent Application No. 418616 describes sweetener compositions comprising an artificial sweetener and a yeast extract. Such compositions have a saccharide-type flavour and the bitter notes typical of the artificial sweetener are partially masked. The yeast extracts used in said compositions may comprise 5'-ribonucleotides, especially 5'-IMP and/or 5'-GMP. These compositions have actually the disadvantage of partially conferring to the foodstuff where they are used a light brothy/bouillon taste due to the yeast extract itself. This problem is especially evident in carbonated drinks.

The present invention provides artificial sweetener compositions comprising 5'-ribonucleotides wherein said 5'-ribonucleotides do not require prior extraction from their RNA natural source, i.e. they are added to the composition in the form of a yeast extract which is as well clean in taste. The wording "clean in taste" means that when the yeast extract is used in food/foodstuff any particular taste/note proper of the yeast extract itself is minimal or absent in said food/foodstuff.

Yeast extract is a composition which comprises the soluble components extracted from a yeast cell or modified components thereof. This composition will comprise at least 5'-ribonucleotides and free amino acids. In general this composition will also comprise proteins, peptides, vitamins, carbohydrates and salts like phosphates.

The invention discloses a composition comprising an artificial sweetener and a yeast extract, said yeast extract comprising free amino acids and one or more 5'-ribonucleotide(s), wherein the total amount of said one or more 5'-ribonucleotide(s) is at least 10% w/w, wherein said one or more 5'-ribonucleotide(s) comprises 5'-GMP and optionally 5'-IMP and wherein the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is lower than 3.5, all weights in the yeast extract being based on NaCl free yeast extract dry matter.

The yeast extract used in the invention is generally obtained from yeast strains with a high RNA content. By this way a high amount of 5'-ribonucleotides is generated during the hydrolytic process. Generally yeast strains are used belonging to the genera *Saccharomyces*, *Kluyveromyces* and *Candida*. Yeast strains belonging to the genus *Saccharomyces*, for example to the strain *Saccharomyces cerevisiae* are preferred above yeast extracts derived from strains belonging to the genus *Candida*, for example to *Candida utilis* (or Torula yeast), as yeast extracts derived from the latter are characterized by a sweet taste as for example described in the Japanese Patent Application No. 10327802.

With the term "5'-ribonucleotide" it is herewith intended either the free 5'-ribonucleotide or a salt thereof. However all weight percentages of 5'-ribonucleotide contents in the yeast extract are calculated based on the disodium salt heptahydrate thereof and are based on NaCl free yeast extract dry matter. NaCl free yeast extract dry matter means that the calculations are based on yeast extract dry matter only and therefore the sodium chloride contained in the yeast extract is excluded from this calculation.

Surprisingly we have found that when the yeast extract used in the compositions of the invention comprises free amino acids, at least 10% w/w of 5'-ribonucleotides, said 5'-ribonucleotides comprise 5'-GMP and optionally 5'-IMP, and the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is lower than 3.5, the aftertaste of the artificial sweetener in the compositions is considerably reduced or completely masked whereby the taste properties of the yeast extract, generally a bouillon or brothy taste, is absent.

With "percentage (w/w) of the total amount of 5'-GMP and 5'-IMP" it is intended the total amount of 5'-GMP plus 5'-IMP measured as weight percentage in respect of NaCl free yeast extract dry matter.

With "percentage (w/w) of free amino acids" used in the ratio above it is intended the weight percentage of free amino acids in the yeast extract based on NaCl free yeast extract dry matter.

Preferably the yeast extract used in the composition of the invention comprises both 5'-IMP and 5'-GMP.

Preferably, the yeast extract used in the invention has a low content in free amino acids and/or a low degree of protein hydrolysis. The degree of protein hydrolysis in the yeast extract is measured as the percentage of nitrogen belonging to primary amino groups of proteins, peptides or free amino acids in respect of the total nitrogen of protein origin in the yeast extract.

The yeast extract used in the compositions of the invention preferably comprises an amount of free amino acids lower than 40% w/w, more preferably lower than 35% w/w, even more preferably lower than 25% w/w, most preferably lower than 20% w/w in the yeast extract, based on NaCl free yeast extract dry matter. The yeast extract used in the composition of the invention preferably comprises amount of free amino acids of at least 1% w/w, more preferably of at least 5% w/w based on total amount of amino acids in the yeast extract, on NaCl free yeast extract dry matter.

The yeast extract used in the compositions of the invention preferably has a degree of protein hydrolysis lower than 50%, preferably lower than 45%. The yeast extract used in the composition of the invention preferably has a degree of hydrolysis of at least 5%, more preferably of at least 10%, even more preferably of at least 20% and most preferably of at least 30%.

The yeast extract used in the compositions of the invention preferably comprises a total amount of the one or more 5'-ribonucleotide(s) between 10 and 50% w/w based on NaCl free yeast extract dry matter, preferably between 10 and 40% w/w, more preferably between 10 and 30% w/w, even more preferably between 10 and 25% w/w.

The presence of 5'-GMP and optionally 5'-IMP in the yeast extract has a beneficial effect in suppressing the artificial sweetener aftertaste when the compositions according to the invention are used in foodstuff. Preferably the yeast extract used in the compositions of the invention comprises both 5'-GMP and 5'-IMP.

In a preferred embodiment of the invention, the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is at least 5% w/w based on NaCl free yeast extract dry matter, preferably it is comprised between 5 and 25% w/w, more preferably between 5 and 20% w/w, even more preferably between 5 and 15% w/w.

We have surprisingly found that when yeast extract having a ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP lower than 3.5 is used in the compositions of the invention, an optimum masking effect of the artificial sweetener aftertaste is obtained without conferring to the food any brothy/bouillon taste typical of the yeast extract. In a preferred embodiment of the invention in the composition according to the invention a yeast extract is used wherein the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is at least 0.1, preferably at least 0.3 more preferably at least 0.5 and most preferably at least 1.

In a preferred embodiment of the invention a yeast extract is used wherein the ratio between the percentage (w/w) of free amino acids and thepercentage (w/w) of the total amount of 5'-GMP and 5-'IMP in the yeast extract is lower than 3, preferably lower than 2.5 and more preferably lower than 2.

The yeast extracts used in the compositions according to the invention are preferably characterised by a low sodium chloride content. The latter is advantageous because a high content of sodium in the diet is detrimental to health. A low content in sodium chloride is also advantageous to the taste of the foodstuff where the compositions of the invention are used. The amount of sodium chloride in the yeast extract is preferably lower than 8% w/w, preferably comprised between 0 and 7% w/w based on yeast extract dry matter, preferably between 0 and 5% w/w, more preferably between 0 and 3% w/w, even more preferably between 0 and 1.5% w/w, most preferably between 0 and 1% w/w based on yeast extract dry matter.

Generally the yeast extract used in the compositions of the invention comprises as well mono sodium glutamate (MSG).

In the compositions of the invention the weight ratio between artificial sweetener and yeast extract, based on NaCl free yeast extract dry matter, is preferably lower than 15, more preferably lower than 10, even more preferably lower than 8, and most preferably lower than 6. In compositions of the invention the weight ratio between artificial sweeteners and yeast extract based on NaCl free yeast extract, based on NaCl free

yeast extract dry matter is preferably at least 0.001, more preferably at least 0.01, even more preferably at least 0.1, still more preferably at least 0.5 and most preferably at least 1.This ratio ensures a good balance between masking of artificial sweetener aftertaste in the food and avoiding conferring to the food any yeast extract specific taste.

Any artificial sweetener falling under the description above can be used in the compositions of the invention. Preferred artificial sweeteners are aspartame, saccharin, acesulfame-K, alitame, cyclamate, neohesperidine, sucralose, stevioside, thaumatin, or mixtures thereof. Especially preferred are aspartame, saccharin, acesulfame-K, and cyclamate, or mixtures thereof. The use of a combination of artificial sweeteners in the compositions of the invention can be advantageous, as it is known that several sweeteners show a synergistic effect. That means that when some artificial sweeteners are combined with each other the combination is sweeter than the sum of the sweetness, provided by the respective amount of the individual sweeteners.

It has been surprisingly found that when the yeast extract used in the compositions of the invention is carefully selected using the above-mentioned criteria, compositions are obtained free of the disadvantages mentioned above.

For example, when the compositions according to the invention are added to beverages, for example to carbonated or non-carbonated soft drinks, a beverage is obtained which is sweet but does not have the typical after taste of artificial-sweetener-containing drinks and is free from any taste intrinsic to the yeast extract itself.

The compositions according to the invention can be prepared prior to being used in the food. It is also possible to add the single components of the compositions to the food separately, so that the sweetener composition is formed directly in the food.

The compositions of the invention can be used in several types of food products. The compositions of the invention can also be used in the form of table-top sweeteners, for example as sweetener tablets, spoon-for-spoon sweeteners and sweeteners sachets.

Therefore the invention provides with the use of a composition according to the invention in a food product or as food product as such.

Preferably an amount of at least 0.02% w/w of yeast extract relative to the food product is used, more preferably at least 0.03% and most preferably at least 0.04% w/w. Preferably this amount is lower than 3% w/w of yeast extract relative to the food product, more preferably lower than 2% w/w and most preferably lower than 1% w/w. Generally, the weight ratio between artificial sweetener and yeast extract in the food product, based on

NaCl free yeast extract dry matter, is lower than 15, preferably lower than 10, more preferably lower than 8, and most preferably lower than 6.

Generally this weight ratio between artificial sweetener and yeast extract in the food product based on NaCl free yeast extract dry matter, is at least 0.001, preferably at least 0.01, even more preferably at least 0.1, still more preferably at least 0.5 and most preferably at least 1.

Further, the invention provides food products comprising a composition of the invention. The compositions of the invention can be used to sweeten all types of food. Examples of food products, which can be sweetened with the compositions of the invention, include: beverages (e.g., carbonated and non-carbonated soft drinks, fruit drinks, squashes, iced teas, coffees and hot chocolate drinks); dairy products (e.g. yoghurts, dairy desserts); confectionery (e.g. chewing gum, sweets, chocolate, breath mints). Further, the compositions of the invention can also be used in bakery products (e.g. cakes, bread, caked goods and mixes), dressings, sauces, low fat-products, frozen desserts (e.g. ice cream, frozen snacks); powdered products (powdered soft drinks, milkshake mixes, and multivitamin drinks); cereals and cereal mixes, like mueslis; and preserves (e.g. fruit preserves, canned fruits). The invention does not exclude the use of the compositions according to the invention in pharmaceuticals, for example in effervescent tablets, chewable tablets and sachets.

The invention further provides the use of a yeast extract for masking the after taste of an artificial sweetener in a food product.

This goal is reached with the use of a yeast extract for masking the after taste of an artificial sweetener in a food product, characterized in that said yeast extract comprises free amino acids and one or more 5'-ribonucleotide(s), wherein the total amount of said one or more 5'-ribonucleotide(s) is at least 10% w/w, wherein said one or more 5'-ribonucleotide(s) comprises 5'-GMP and optionally 5'-IMP and wherein the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is lower than 3.5, all weights in the yeast extract being based on NaCl free yeast extract dry matter.

Other advantageous characteristics of the yeast extract, which can be used to mask the aftertaste of an artificial sweetener in a food product, have been already described above.

Preferably, an amount of at least 0.02% w/w of yeast extract relative to the food product is used, more preferably at least 0.03% w/w and, even more preferably at least 0.04% w/w. Preferably, an amount of lower than 3% w/w of yeast extract relative to the food product is used, more preferably lower than 2% w/w and even more preferably lower than 1%w/w.

It has been observed that when the above-mentioned yeast extracts are used in beverages like Coca Cola® Light, Fanta® Light, or 7-Up® Light the artificial sweetener unpleasant notes are completely suppressed as verified by panels of experts in the tasting of foodstuff. Therefore the use of the yeast extract of the present invention are advantageously applied in carbonated drinks.

The invention will now be illustrated by some examples, which however are not intended to be limiting.

Example 1

In this example the effect of the addition of a yeast extract comprising at least 10% w/w of 5'-ribonucleotides, at least 5% w/w of 5'-IMP+5'-GMP, less than 8% w/w NaCl and a ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-IMP + 5'-GMP in the yeast extract lower than 3.5 was tested on several light beverages.

Ingredients

Maxarome Plus LS powder (DSM-Delft The Netherlands)*

Water

Coca Cola Light (Coca Cola Enterprises Nederland B.V.)

Fanta Light (Coca Cola Enterprises Belgium sprl/bvba)

7-Up Light (Vrumona The Netherlands)

Lipton Icetea light (Lipton)

Coca Cola Light contains sodium-cyclamate, acesulphame-k and aspartame.

Fanta Light contains aspartame, saccharine.

7 UP Light contains aspartame

Lipton Icetea Light contains, aspartame, acesulphame-K.

* Maxarome Plus LS powder is a yeast extract comprising 5'-ribonucleotides. It comprises 13% w/w of total 5'-ribonucleotides, 6.5% w/w of 5'-IMP + 5'-GMP, 11.8% w/w of free amino acids, these percentages all based on NaCl free yeast extract dry matter, 0.8% w/w of NaCl and a degree of protein hydrolysis of 34%.

A 1% w/w solution in water of Maxarome Plus LS was prepared.

Two grams of the1% w/w Maxarome Plus LS water solution were added to 50 g samples of the following light drinks: Coca Cola Light®, Fanta Light®, 7-Up Light®, and Lipton Icetea Light®. Each sample of light drink contained 0.04% w/w of Maxarome Plus LS. Blank samples of each light drink were prepared by adding 2 g of water to 50 g samples of each drink. The ratio between artificial sweeteners and yeast extract in the samples in approximately 1 to 1.5. A panel of 6 experts in the tasting of beverages tested the blank samples and those containing 0.04% w/w of Maxarome Plus LS. All experts recognised that the light drink comprising the yeast extract had a better taste, the light drinks comprising the yeast extracts were recognized as less bitter, therefore more pleasant in taste. The long lasting after taste typical of artificial sweeteners was completely suppressed. The taste of the samples comprising Maxarome Plus LS if compared with that of the blank samples was judged as follows. The Coca Cola light flavour profile shifted to less watery, more mouthfeel. In the Fanta flavour profile there was a shift in taste from orange peel to orange juice. The taste of the 7-Up sample comprising Maxarome Plus LS was judged less astringent and more mouthfeel. In the Lipton Ice Tea sample the astringent notes from the tea were decreased and the flavour became richer and more balanced.

Example 2

In this example the effect of the concentration in light drinks of the yeast extract used in example 1 is examined.

Ingredients

Maxarome Plus LS powder (DSM-Delft)*

Water

Coca Cola Light (Coca Cola Company) (the beverage comprises approximately 0.06% w/w of artificial sweetener).

A 4% w/w solution in water of Maxarome Plus LS was prepared.

The following solutions were prepared:

(1) 0.5 g of 4% w/w Maxarome Plus LS were added to 50 g Coca Cola Light giving a 0.04% w/w Maxarome in Coca Cola Light.

(2) 0.4 g of 4% w/w Maxarome Plus LS were added to 50 g Coca Cola Light giving a 0.032% w/w Maxarome in Coca Cola Light.

(3) 0.3 g of 4% w/w Maxarome Plus LS were added to 50 g Coca Cola Light giving a 0.025% w/w Maxarome in Coca Cola Light.

(4) 0.2 g of 4% w/w Maxarome Plus LS were added to 50 g Coca Cola Light giving a 0.016% w/w Maxarome in Coca Cola Light.

Blank samples for each solution were prepared as solution (1) to (4) by replacing the amount of Maxarome solution with water.

The panel of 6 experts of example 1 tested all solutions. While solution (1) to (3) were recognised as less bitter and without aftertaste as well as were recognized as better in taste in respect with the corresponding blanks, for solution (4) no difference in respect with the blank was found.

This example also shows that the skilled person can easily determine the effective amount of yeast extract needed according to the present invention for Coca Cola light in this case or for a food product containing an artificial sweetener in general.

Example 3

In this example the effect of the yeast extract described in example 1 to mask the aftertaste of artificial sweetener in Coca Cola Light is compared with other yeast extracts.

Ingredients

Maxarome Plus LS powder (DSM-Delft, The Netherlands)*

KRIT* (Ohly, Marl, Germany)

KAT** (Ohly, Marl, Germany)

Water

Coca Cola Light (Coca Cola Company) (the beverage comprises approximately 0.06% w/w of artificial sweetener).

*KRIT is a yeast extract comprising 8.5% w/w of total 5'-ribonucleotides, 4.3% w/w 5'-GMP + 5'-IMP, 16.2% w/w of free amino acids, these percentages based on NaCl free yeast extract dry matter, 12% NaCl, and having a degree of protein hydrolysis of 38%.

**KAT is a yeast extract comprising 44.6% w/w of free amino acids, these percentage based on NaCl free yeast extract dry matter, 1% NaCl, and having a degree of protein hydrolysis of 57%.

Solutions comprising 0.02% w/w of KRIT, KAT and Maxarome Plus respectively in Coca Cola Light were prepared in an analogous way as described in examples 1 and 2. For Maxarome Plus also a solution 0.04% w/w in Coca Cola Light was prepared. A panel of 6 experts in the tasting of foodstuff tested these samples and compared the taste thereof. The solution comprising KRIT yeast extract was characterised by a still present light aftertaste if compared with a blank sample (see example 1). A light bouillon-like taste was also present. The solution comprising KAT yeast extract was also characterised by a more intense aftertaste if compared with the solution comprising KRIT and by a light bouillon-like taste. The solutions comprising Maxarome were characterised by no aftertaste, with no bouillon/brothy notes, by a neutral taste, more similar to Coca Cola.

CLAIMS

1. A composition comprising an artificial sweetener and a yeast extract, said yeast extract comprising free amino acids and one or more 5'-ribonucleotide(s), wherein the total amount of said one or more 5'-ribonucleotide(s) is at least 10% w/w, wherein said one or more 5'-ribonucleotide(s) comprises 5'-GMP and optionally 5'-IMP and wherein the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is lower than 3.5, all weights in the yeast extract being based on NaCl free yeast extract dry matter.

2. A composition according to claim 1 wherein said yeast extract comprises an amount in free amino acids lower than 40%, preferably lower than 35%, more preferably lower than 25%, and most preferably lower than 20% based on total amount NaCl free yeast extract dry matter, and/or that said yeast extract comprises an amount in free amino acids of at least 1% based on NaCl free yeast extract dry matter and preferably of at least 5%.

3. A composition according to claim 1 or 2 wherein the degree of protein hydrolysis in said yeast extract is lower than 50%, and preferably lower than 45% and/or that the degree of protein hydrolysis is said yeast extract is at least 5%, preferably at least 10%, more preferably at least 20% and most preferably at least 30%.

4. A composition according to any one of claims 1 to 3 wherein said yeast extract comprises a total amount of the one or more 5'-ribonucleotide(s) between 10 and 50% w/w based on NaCl free yeast extract dry matter, preferably between 10 and 40% w/w, more preferably between 10 and 30%, even more preferably between 10 and 25% w/w.

5. A composition according to claim 4 wherein the amount of 5'-GMP and 5'-IMP in the yeast extract is at least 5%w/w based on NaCl free yeast extract dry matter, preferably it is comprised between 5 and 25% w/w, more preferably between 5 and 20% w/w, even more preferably between 5 and 15% w/w.

6. A composition according to any one of claims 1 to 5 wherein the ratio between the percentage (w/w) of free amino acids and the total percentage (w/w) of 5'-IMP and 5'-GMP in the yeast extract is at least 0.1, preferably at least 0.2, more preferably at least 0.5 and most preferably at least 1 and/or wherein the ratio is lower than 3, preferably lower than 2.5 and more preferably lower than 2.

7. A composition according to any one of claims 1 to 6 wherein the yeast extract comprises an amount of sodium chloride lower than 8% w/w, preferably comprised between 0 and 7% w/w, preferably between 0 and 5% w/w, more preferably between 0 and 3% w/w, even more preferably between 0 and 1.5% w/w, most preferably between 0 and 1% w/w based on yeast extract dry matter.

8. A composition according to any one of claims 1 to 7 wherein the weight ratio between artificial sweetener and yeast extract, based on NaCl free yeast extract dry matter, is lower than 5, preferably lower than 10, more preferably lower than 8, and most preferably lower than 6 and/or said ratio is at least 0.001, preferably at least 0.01, more preferably at least 0.1, still more preferably at least 0.5 and most preferably at least 1.

9. A composition according to any one of claims 1 to 8 wherein the artificial sweetener is selected form the group of acesulfame-K, alitame, aspartame, cyclamate, neotame, neohesperidine, saccharin, stevioside, sucralose, and thaumatin, or it is a mixture thereof.

10. A use of a composition according to any one of claims 1 to 9 in a food product or as food product as such.

11. A use according to claim 10 wherein an amount of at least 0.02% w/w of yeast extract relative to the food product is used, preferably at least 0.03% w/w, and more preferably at least 0.04% w/w, and/or an amount of lower than 2% and more preferably lower than 1% of yeast extract relative to the food product.

12. A use according to claim 10 or 11 wherein the weight ratio between artificial sweetener and yeast extract in the food product based on NaCl free yeas' extract dry matter, is lower than 15, preferably lower than 10, more preferably lower than 8, and most preferably lower than 6 and/or that ratio is preferably at least 0.001, more preferably at least 0.01, even more preferably at least 0.1, still more preferably at least 0.5 and most preferably at least 1.

13. A food product comprising a composition according to any one of claims 1 to 9.

14. A food product according to claim 13 wherein the food production is a beverage.

15. A food product according to claim 14 wherein the food product is a carbonated and/or soft drink.

16. A food product according to claim 13 wherein the food product is a dairy product.

17. A food product according to claim 13 wherein the food product is a bakery product.

18. Use of a yeast extract for masking the after taste of an artificial sweetener in a food product wherein said yeast extract comprises free amino acids and one or more 5'-ribonucleotide(s), wherein the total amount of said one or more 5'-ribonucleotide(s) is at least 10% w/w, wherein said one or more 5'-ribonucleotide(s) comprises 5'-GMP and optionally 5'-IMP and wherein the ratio between the percentage (w/w) of free amino acids and the percentage (w/w) of the total amount of 5'-GMP and 5'-IMP in the yeast extract is lower than 3.5, all weights in the yeast extract being based on NaCl free yeast extract dry matter.

19. The use of claim 18 wherein said yeast extract comprises an amount in free amino acids lower than 40%, more preferably between 5 and 35%, even more preferably between 5 and 25%, most preferably between 5 and 20% based on total NaCl free yeast extract dry matter.

20. The use of claim 18 or 19 wherein that said yeast extract has a degree of protein hydrolysis lower than 50% and preferably lower than 45% and/or a degree of protein hydrolysis of at least 5%, preferably at least 10%, more preferably at least 20% and most preferably at least 30%.

21. Use according to any one of claims 18 to 20 wherein an amount of at least 0.02% w/w of yeast extract relative to the food product is used, preferably of at least 0.03% w/w, more preferably of at least 0.04% w/w and/or an amount of lower than 2% w/w, more preferably of lower than 1% w/w of yeast extract relative to the food product.

INTERNATIONAL SEARCH REPORT

Internatl Application No
PCT/EP 03/00947

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A23L1/22 A23L1/226 A23L1/229 A23L1/236 A23L1/30
A23L2/00 A23L2/52 A23L2/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 1 016 708 A (NIHON TOBACCO INC) 5 July 2000 (2000-07-05) the whole document ---	1-21
X	EP 0 418 616 A (DEUTSCHE HEFEWERKE) 27 March 1991 (1991-03-27) page 2, line 23 -page 3, line 4; examples ---	1-21
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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Date of the actual completion of the International search	Date of mailing of the international search report
27 June 2003	04/07/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Vernier, F

INTERNATIONAL SEARCH REPORT

Internati[redacted] Application No
PCT/EP 03/00947

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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